

SECTION 10 73 00
TRANSLUCENT WALKWAY / CANOPY SYSTEMS**PART 1 GENERAL**

- 1.01 RELATED DOCUMENTS:
- A. The General Conditions of the Contract, including Supplementary Conditions and Division 1 - General Requirements, apply to the work of this Section.
- 1.02 WORK INCLUDED:
- A. Design, manufacture and installation of translucent insulating system. An assembly of extruded Nano-Cell polycarbonate glazing panels incorporated into a complete aluminum framed system that has been tested and warranted by the manufacturer as a single source system.
 - B. All anchors, brackets, and hardware attachments necessary to complete the specified structural assembly, weatherability and water-tightness performance requirements. All flashing up to but not penetrating adjoining work are also required as part of the system and shall be included.
 - C. Trained and factory authorized labor with supervision to complete the entire panel installation.
- 1.03 RELATED WORK SPECIFIED ELSEWHERE:
- A. Section 03 30 00 - Cast in Place Concrete
 - B. Section 05 12 00 - Structural Steel
 - C. Section 07 40 00 - Roofing.
 - D. Section 07 60 00 - Flashing and Sheet Metal.
 - E. Section 07 92 00 - Joint Sealant.
- 1.04 QUALITY ASSURANCE
- A. Panel system must be evaluated and listed by recognized building code authorities: International Council Evaluation Service Inc (ICC-ES) and SBCCI - Public Safety Testing and Evaluation Services Inc.
 - B. Materials and Products shall be manufactured by a company continuously and regularly employed in the manufacture of canopies using polycarbonate (not glass) panel systems for a period of at least ten (10) years. Manufacturers shall provide a list of at least ten (10) projects having been in place a minimum of ten (10) years, with similar size, scope, climate and type.
 - C. Erection shall be by a factory-approved installer which has been in the business of erecting similar material for at least five (5) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.
 - D. The manufacturer shall be responsible for the configuration and fabrication of the complete panel system, and will ensure that it fully meets all requirements of this specification.

E. APPROVED MANUFACTURERS:

All manufacturers acceptable for use on this project under this section must be approved prior to bid. Manufacturers must submit evidence of compliance with all performance criteria specified herein. This evidence must include proof of conformance and test reports as specified below. Any exceptions taken from this specification must be noted on the approval request. If no exceptions are noted and approval is given, product performance will be as specified. Should non-compliance be subsequently discovered, the previously given approval will be invalidated and use of the product on the project will be disallowed. Requests for approval, with all appropriate submittal data and samples must be received no less than 15 days prior to bid date. A list of all approved manufacturers and products will be issued by addendum. No other manufacturers will be acceptable. No verbal approval will be given.

1.05 SUBMITTALS:

- A. Submit shop drawings and color samples in accordance with Section 01 33 23.
- B. The manufacturer shall submit written guarantee accompanied by substantiating data, stating that the products to be furnished are in accordance with or exceed these specifications.
- C. The manufacturer shall submit certified test reports made by an independent organization for each type and class of panel system. Reports shall verify that the material will meet all performance requirements of this specification. Previously completed test reports will be acceptable if they are current and indicative of products used on this project. Test reports required are:
 - 1. Self Ignition Temperature (ASTM 1929-3)
 - 2. Smoke Density (ASTM D-2843)
 - 3. Burning Extent (ASTM D-635)
 - 4. Interior Flame Spread (ASTM E-84)
 - 5. Color Difference (ASTM D-2244-85)
 - 6. Weathering (ASTM D-4364)
 - 7. Yellowing Index (ASTM D-1925)
 - 8. Weathering Evaluation before and after exposure to 300°F, 25 minutes include Light Transmission, Color Change, and Yellowing Index, per ASTM E-1175, ASTM D-2244 and ASTM D-1925 respectively.
 - 9. Shatter Resistance (ASTM D-3841/SPI Method B)
 - 10. Large Missile Test - Impact Resistance per SFBC PA 201-94
 - 11. Insulation "U" Factor per NFRC100 test methods and procedures
 - 12. Water Penetration (ASTM E-331)
 - 13. Load Bearing Capability (ASTM E-330-97)
 - 14. OSHA Life Safety Fall and Walk Through Protection for 300 lb. point load per STD 29 CFR 1910.23 (e)(8)
 - 15. OSHA Life Safety STD 29 CFR - Impact loading by blunt object of 500 ft. lbs. per ASTM E-695-03

16. Performance of exterior windows, curtain walls when impacted by wind-borne debris per ASTM E 1996-02, Level D
17. IES LM-44-90 Testing for Total and Diffused Reflectometry (Diffused Light Transmission)

D. MAINTENANCE DATA: The manufacturer shall provide recommended maintenance procedures, schedule of maintenance and materials required or recommended for maintenance.

1.06 WARRANTY:

- A. Provide a single source canopy system manufacturer warranty for glazing panels and framing system - third party warranty for glazing panels shall not be acceptable.
- B. Provide manufacturer 10 year warranty to include:
 1. Change in light transmission of no more than 6% per ASTM D-1003
 2. No delamination of panel affecting appearance, performance or structural integrity of the panel or the system.
 3. Thermal aging - the light transmission and the color shall not change after exposure to heat of 300°F for 25 minutes. (When measured per ASTM D-1003 and ASTM D-2244 respectively).

PART 2 PRODUCTS

2.01 Basis of Design:

The design and performance criteria of this job are based on products manufactured by CPI Daylighting, Inc., Phone: (800) 759-6985, Fax (847) 816-0425.

2.02 TRANSLUCENT PANEL PERFORMANCE

- A. Nano-Cell Panel Technology - Longevity and Resistance to Buckling and Pressure
 1. Translucent Panels must be of Nano-Cell technology. Wide Cell technology (cell size exceeding 0.18") shall not be acceptable.
 2. The translucent panel shall include an integral extruded Nano-Cell structural core. The panel's exterior skins shall be connected with supporting continuous ribs, perpendicular to the skins, at a spacing not to exceed 0.18" (truss-like construction). In addition, the space between the two exterior skins shall be divided by multiple parallel horizontal surfaces, at a spacing not to exceed 0.18".
- B. Appearance:
 1. Panel assembly thickness shall be a minimum .47" (12mm) single panel with exposed interlocking 1.25" wide U battens.
 2. Panel Width: Shall not exceed 2' to ensure best performance for wind uplift, vibration, oil canning and visual appearance. Panels over 2' wide will not be approved.

3. The panels shall be uniform in color with an integral Nano-Cell core. In a cross section, the core shall be constructed of Nano-Cell honeycomb cells not to exceed 0.18" x 0.18". The appearance should be equal to CPI's Pentaglas 12 Panel. Wide cell panel configurations greater than 0.18" by .018" shall not be accepted.

C. Translucent Panel Joint System:

1. Panel shall be extruded in one single formable length. Maximum panel width shall not exceed 2'. Transverse connections are not acceptable.
2. The panels should be manufactured with grip-lock double tooth upstands that are integral to the unit. The upstands shall be 90 degrees to the panel face (standing seam dry glazed concept). Welding or gluing of upstands or standing seam is not acceptable.
3. The U or H battens shall have a grip-lock double tooth locking mechanism to ensure maximum uplift capability.
4. The metal retention clip shall be configured with a 0.4" wide top flange that extends continuously across the web from end to end and from side to side. To allow a safety factor, the clip must be tested to meet a wind uplift standard of 90 psf per ASTM E330-97.
5. The panel system U connection shall meet wind load performance requirements without deterioration after 100 months of Florida outdoor exposure. This performance must be demonstrated by providing independent lab comparison test reports for a weathered vs. a new panel assembly. As a standard for all systems, provide test reports for a 16mm panel assembly, 6' wide x 12' long that have been exposed to Florida weather conditions for 100 months per ASTM E-330-97 for loading, ASTM E 1886-97 for cycling and ASTM E-1996-02 for missile impact at design load of 70 PSF.
6. Water Penetration: No water penetration of the panel U / H joint connection length at test pressure of 10.0 PSF per ASTM E-331
7. Free movement of the panels shall be allowed to occur without damage to the weather tightness of the completed system.

D. Flammability

1. The exterior and interior faces shall be an approved light transmitting panel with a CCl fire rating classification per ASTM D-635. Flame spread no greater than 25 per ASTM E-84. Smoke density no greater than 75 per ASTM D2843 and a minimum self-ignition temperature of 1000°F per ASTM 1929. The panel shall be self-extinguishing.
2. Interior flame spread classification of Class I per ASTM E84.

E. Impact Resistance - the panels shall pass the following tests:

1. ASTM D-3841/SPI - Impact and Shatter Resistance of 200 ft. lbs.
2. SFBC - PA 201-94, impact resistance of 350 ft. lbs.
3. ASTM E-1996-02 - Must comply with standard specification for performance of exterior windows or curtain walls when

impacted by windborne debris at level D and after cyclic wind loading at the specified design load.

F. OSHA Life Safety Standards 29 CFR 1926.502 (i)(2) and 29 CFR 1910.23 (e)(8)

1. Panel assembly shall withstand impact loading by blunt object of 500 ft. lbs. per ASTM E695-03
2. Panel assembly shall withstand a 300 lb. point load at 5' span per OSHA standard 29CFR 1910 23e8.

G. Weatherability:

1. The light transmission as measured by ASTM D1003, shall not decrease more than 6% over 10 years, or after exposure to temperature of 300°F for 25 minutes (thermal aging).
2. The panel shall be tested by recognized laboratory for weathering evaluation per ASTM D4364-84 (EMMAQUA, UNBACKED), after exposure to minimum concentrated natural sunlight radiation of 56000 MJ/M² (1540 MJ/M² of UV, 200 - 385 N.M). The panel shall not change in color more than 4.0 units Delta E, 4.0 units Delta L and Delta B.
3. The panel shall not change color more than 4.0 units (DELTA-E by ASTM D2244) after 60 months outdoor weathering in Arizona determined by an average of at least two samples.
4. Thermal aging - the interior and exterior faces shall not change color in excess of 0.75 Delta E by ASTM D2244 and shall not darken more than 0.3 units (Delta L by ASTM D2244) and 0.2 units Delta Y (YI) by ASTM D1925 and shall not show cracking or crazing when exposed to 300°F for 25 minutes.
5. The faces shall not become readily detached when exposed to temp of 300°F and 0°F for 25 minutes.
6. Panels shall consist of a polycarbonate resin with a permanent, co-extruded, ultra-violet protective layer. Post-applied coating or films of dissimilar materials are unacceptable. Fiberglass skins are unacceptable.
7. UV Maintenance: The system shall require no scheduled re-coating to maintain its performance or for UV protection.
8. Panel shall be factory sealed at the sill to restrict dirt ingress.

H. Diffused Light Transmission:

As a reference for measuring the quality of the diffused light through the panel assembly, the IES (Illuminating Engineering Societies) LM-44-1990 Approved Method for Total and Diffuse Reflectometry procedure shall be used. Results for a Clear Pentaglas / Single Glazed panel assembly shall be provided as a base standard for comparison.

For Pentaglas / Single Glazed systems with total illuminator flux output at 60 lumens, diffused light transmission requirements are:

| Zonal | % of transmittance from the maximum |
|-------|-------------------------------------|
|-------|-------------------------------------|

| Zone panels | total lumens transmitted through the |
|----------------|--------------------------------------|
| 0-30 | 66.0 |
| 0-40 | 78.5 |
| 0-60 | 94.0 |
| 0-90 | 100.0 |

I. The minimum ratio of the panel weight to the panel thickness should be:

For 0.47" thick Pentaglas 12 panel, 0.54 LB. per S.F.

2.03 METAL FRAME STRUCTURE

- A. To meet ANSI/ASCE 7-05 building design load, design criteria shall be:
 - 1. Wind Load 20 PSF.
 - 2. Snow Load 30 PSF.
- B. The CPI Clearspan CRP Vaulted Canopy framing system with aluminum columns, beams, rafters, purlins and perimeter edge framing is designed to be self-supporting between the support constructions. The canopy framing design includes side and end overhangs without horizontal crossbeam ties. The deflection of the Structural framing members in a direction normal to the plane of the glazing, when subjected to a uniform load deflection, shall not exceed L/60 for the unsupported span. The canopy will impose reactions to the support construction. All adjacent and support construction must support the transfer of all loads including horizontal and vertical, exerted by the canopy. Design or structural engineering services for the supporting structure or building components not included in the canopy scope are not included under this section.
- C. Water Penetration: The canopy system shall allow no water penetration at a minimum differential static pressure of 6.24 lbs. per sq. ft. per AAMA 501-94 Pressure Difference Recommendations and as demonstrated by prior testing of typical framing sample per ASTM E-331
- D. Water test of canopy system shall be conducted according to procedures in AAMA 501.2

2.04 METAL MATERIALS

- A. Extruded Aluminum shall be ANSI/ASTM B221; 6063-T6: 6063-T5 or 6005-T5.
- B. Flashing:
 - 1) 5005 H34 aluminum 0.04" minimum thickness.
 - 2) Sheet metal flashings/closures/claddings are to be furnished shop formed to profile - when lengths exceed 10 ft. in nominal 10-ft lengths. Field trimming of the flashing and field forming the ends is necessary to suit as-built conditions. Sheet metal ends are to overlap at least 6-in. to 8-in., set in a full bed of sealant and riveted if required.
- C. All Fasteners for aluminum framing to be stainless steel or cadmium plated steel, excluding the final fasteners to the building.
- D. All exposed ALUMINUM FINISH shall be a standard color as selected by Architect from manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. General Contractor to verify when structural support is ready to receive all work in this section and to convene a Pre-Installation Conference at least one week prior to commencing work of this Section. Attendance required of General Contractor, skylight installer and all parties directly affecting and effected by the work of this section.
- B. All submitted opening sizes, dimensions and tolerances are to be field verified by general contractor unless otherwise stipulated.
- C. Installer to examine area of installation to verify readiness of site conditions. Notify general contractor about any defects requiring correction. Do not work until conditions are satisfactory.

3.02 INSTALLATION

- A. Install components in strict accordance with manufacturer's instructions and approved shop drawings. Use proper fasteners and hardware for material attachments as specified.
- B. Use methods of attachment to structure allowing sufficient adjustment to accommodate tolerances.
- C. Remove all protective coverings on panels immediately after installation.

3.03 CLEANING

- A. Follow manufacturer's instructions when washing down exposed panel surfaces using a solution of mild detergent in warm water that is applied with soft, clean wiping cloths.
- B. Follow strict panel manufacturer guidelines when removing foreign substances from panel surfaces requiring mineral spirits or any solvents that are acceptable for use.
- C. Installers shall leave panel system clean at completion of installation. Final cleaning is by others upon completion of project, following manufacturer's cleaning instructions.

END OF SECTION